Moral Distress in Nurses Providing Direct Patient Care on Inpatient Oncology Units

DNP Final Project

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by

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The James Inpatient Nurse Managers

All inpatient nurses at The James that completed the surveys.

Dedication

I dedicate this project to my mother, Martha Tretinik, who always encouraged me to strive for my goals. She has offered me endless support throughout my lifetime and words of encouragement as I progressed through the DNP Program.

Abstract

Many authors have described moral distress in nurses working at the bedside. Most research has focused on nurses working in critical care units. There is limited research on other types of units. The aims of this project were: to examine the level of moral distress in nurses who work on inpatient oncology units; to compare moral distress by the demographic characteristics of nurses and work experience variables; and to identify demographic characteristics and type of clinical setting that may predict which nurses are at risk for moral distress. This project was a cross sectional survey design with staff nurses working on inpatient units at the Ohio State University (OSU) Arthur G. James Cancer Hospital & Richard J. Solove Research Institute (The James). The investigators distributed the Moral Distress Scale – Revised (MDS-R) that is used to assess the intensity and frequency of moral distress to all direct care staff nurses who work at least 50% at The James. The response rate was 27.5% (100/363). The mean MDS-R score in this project was 81.3 and the range was 4.0 – 266. These are slightly lower than the scores found for critical care nurses. Only the level of education and the type of unit correlated with the MDS-R scores. A model using the level of education and the type of unit to predict the MDS-R scores was developed.

Chapter One: Nature of the Project

Introduction to the project

Moral distress was first described by Jameton, a philosopher, as "when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action" (1984, p.6). This definition implies a passive role on the part of the nurse. A more recent definition of moral distress by Kälvemark, Höglund, Hansson, Westerholm, and Arnetz (2004) implies that the health care worker makes an active choice to not follow their conscience. Hamric, Borchers, and Epstein (2012) suggest that there are three categories of constraints that may lead to moral distress. These categories are clinical situations such as providing futile care; internal constraints (for example, feeling of powerlessness or lack of knowledge); and external constraints (for example, lack of communication, inadequate staffing, or the competency of the staff). Many authors have described the psychological impact of nurses who have had a prolonged exposure to ethically challenging situations. Schluter, Winch, Holzhauser, and Henderson (2008) also found that some nurses leave their position and/or the profession of nursing as a result of moral distress.

Schluter et al (2008) differentiate between moral distress, reactive distress, moral residue, and moral burden. They define moral distress as the psychological response to knowing the appropriate action but unable to act on it. On the other hand, reactive distress "is a sensation felt by people who do not act on their original feelings of distress" (Schluter et al, 2008, p. 307). Moral residue is the ongoing effect of moral distress which may result in feelings of guilt because the nurse was placed in a situation where he/she was unable to act according to his/her personal ethical code. These authors further explain that nurses have the moral burden to follow physician orders that the nurse may feel is not in the best interest of the patient. This is

exacerbated by the amount of time the nurse spends with the patient in contrast to many physicians.

Purpose

Most of the research on this topic has focused on nurses who work on critical care units. The purpose of this project was to examine the level of moral distress in nurses who work on inpatient oncology units.

Significance of project to nursing and health care as well as relevance to the DNP essentials

Moral distress has been found to be prevalent among nurses who work in critical care settings and some medical surgical settings. Moral distress may lead to physical, psychological, social, and professional problems. This may result in nurses leaving their position or even the profession of nursing (Davis, Schrader, and Belcheir, 2012; Elpern, Covert, and Kleinpell, 2005; Ferrell, 2006; Huffman and Rittenmeyer, 2012; Schluter, Winch, Holzhauser, and Henderson, 2008; Varcoe, Pauly, Webster, and Storch, 2012; Weingand and Funk, 2012). In addition, moral distress also affects the nurse's relationships with patients and families. Nurses may withdraw from patients which may lead to lower quality care and decreased patient satisfaction (DeVillers and Devon, 2012; Gutierrez, 2005; Huffman and Rittenmeyer, 2012; Schluter et al, 2008; Varcoe, Pauly, Storch, Newton, and Makaroff, 2012).

Chism (2010) describes the Essentials of Doctoral Education for Advanced Nursing Practice. Essential III outlines how Doctor of Nursing Practice (DNP) graduates are responsible to translate research into practice. Using the work done on moral distress in critical care nursing and translating it to the inpatient oncology setting expands upon the work previously done.

Project Aims

A. To examine the level of moral distress in nurses who work on inpatient oncology units at

The James Cancer Hospital as measured by the Moral Distress Scale – Revised (MDS-R).

B. To compare moral distress by the demographic characteristics of nurses (age and level of education) and work experience variables (years of experience as a nurse, years of oncology experience, years of experience at The James, and the type of unit where they currently work).

C. To identify demographic characteristics and type of clinical setting that may predict which nurses are at high risk for moral distress.

Chapter Two: Review of Literature

Theoretical framework: Relationship-Based Care

Hardingham (2004) suggests that people develop their moral values and integrity in relationship to those around them. Values are formed through personal reflection and interactions with others as they mature. This same author suggests that ethical decision-making is directly related to group norms and the environment in which one works. For instance, a new nurse with a strong moral compass and ethical standards may find that her standards are eroded over time as she observes her colleague's actions. Hardingham (2004) also proposes that while a nurse may make decisions autonomously, her decisions are impacted by the social and possibly political influences in her clinical unit.

Relationship-Based Care is the theoretical framework used for this project. Relationship-Based Care (RBC), developed by Koloroutis (2004) and colleagues is a conceptual framework that revolves around the care of the patient and family, care of self, and care of colleagues (See appendix A for model). The RBC framework promotes primary nursing as the patient care delivery model. Primary nursing allows the nurse to develop a relationship with the patient and their family that enables the nurse to plan, prioritize, and coordinate care for the patient. The nurse involves the patient and family in developing the plan of care. The primary nurse is in the best position to know the patient's preferences and therefore in the best position to advocate for the patient. For instance, advocating for the patient by assertively suggesting that the health care team review and follow the patient's living will when decisions about end of life treatment arise.

Moral distress may have an impact on the relationship between the nurse and the patient. Several authors found that nurses who are experiencing moral distress withdraw or distance themselves from patients and their families (Austin , Kelecevic, Goble, & Mekechuk, 2009;

Burtson & Stichler, 2010; DeVillers and Devon, 2012; Gutierrez, 2005; Huffman and Rittenmeyer, 2012; Robinson, 2010; Schluter et al, 2008; Varcoe, Pauly, Storch, Newton, and Makaroff, 2012). These nurses provide physical care by completing the required tasks but avoid forming a connection with the patient. Schluter et al (2008) suggest that this is a protective mechanism to avoid further distress. Withdrawal from the patient creates a barrier to effective communication between the patient and his nurse which may result in disjointed care. Robinson (2010) also proposes that an ineffective relationship between the patient and the nurse may impact pain management, increase medical errors, and lead to an increased length of stay. She also suggests that the nurse's relationship with the patient may be the most important since the nurse spends the most time with the patient. A nurse's capacity for caring promotes effective physical and psychological care of the patient. This caring may become disrupted by moral distress. Austin et al (2009) also discovered that nurses may purposefully distance themselves from patients to avoid forming attachments that may increase their susceptibility to further distress.

Gutierrez (2005) found that over 50% of the nurses in her study requested not to be a primary nurse for certain patients and approximately one third revealed that they distance themselves from patients and families. She describes this response as a defense mechanism for nurses to deal with their own distress. She notes that by nurses not serving in a primary nurse role, this may lead to disjointed care, ineffective communication, lack of patient advocacy, and poor patient outcomes. Pauly, Varcoe, Storch, and Newton (2009) used the original Moral Distress Scale (MDS) and Olson's Hospital Ethical Climate Survey (HECS) to survey randomly selected British nurses. The results of the HECS showed that with the exception of their peers,

satisfaction with their relationships (patients, managers, and physicians) had a direct impact on the frequency and intensity of moral distress.

Relationship-Based Care provides the foundation for the understanding of the importance of fully engaged nurses who provide patient care. Relationships with co-workers and other members of the interdisciplinary team may affect how one views ethical issues and may influence how he/she reacts in an ethical situation. Open communication and collaboration between the team may directly impact patient care and outcomes. In addition, alleviating moral distress may enhance the nurse's relationship with his/her patients. Primary nursing may be one strategy that will promote a therapeutic relationship between the nurse and her patient and may lead to better patient outcomes.

Koloroutis (2004) suggests that the health care professional should take responsibility for caring for his/herself to enable his/her to care for others. When caring for oneself, the nurse needs to recognize signs of distress within his/herself and seek the appropriate interventions. Caring for oneself includes recognizing and managing stress and maintaining a work-life balance. Finally, this author states that care of colleagues encourages an open exchange of information and collaboration that is essential to provide quality care in the health care environment. This extends beyond nursing to include the interdisciplinary team. Communication, respect, trust, and support are the keys to teamwork. On the other hand, colleagues should also recognize signs when their peer or other team member needs their support.

There are two major relationships on a clinical unit: the relationship among the interdisciplinary team and the relationship between each team member and the individual patient. These relationships are interconnected. Austin, Kelecevic, Goble, and Mekechuk (2009) noted that collaboration and communication with recognition of each team member's differences

promote an environment that allows for effective problem solving. There is not necessarily less conflict but when conflict does occur, there is open discussion that promotes resolution. This will ultimately lessen the occurrence of moral distress. Gutierrez (2005) suggests that lack of communication and collaboration between the interdisciplinary team and between the team and the patient may lead to decision-making that is in conflict with an individual's moral values. She also suggests that an ineffective relationship with one's manager, such as a perception that there is a lack of support, may have a direct effect on the occurrence of moral distress. Rice, Rady, Hamrick, Verhejde, and Pendergast (2008) offer that communication and collaboration allow a nurse to feel that he/she is an important member of the team and that his/her opinion is respected. This allows for open dialogue and discussions about ethical situations and may in turn lead to less moral distress. On the other hand, Robinson (2010) proposes that moral distress may also lead to ineffective teamwork that then may affect patient outcomes.

Related Research

Clinical Setting. Research has shown that nurses who work in critical care units experience moral distress related to providing futile care, prolonging patients' suffering, and an inability to impact decisions made about the goals for the patient (Elpern et al, 2007; Ferrell, 2006; Gutierrez, 2005). On the other hand, several authors found that nurses who work on medical/surgical units may also experience moral distress (Davis, Schrader, and Belcheir, 2012; Mobley, Rady, Verheijde, Patel, and Larson, 2007; Rice et al, 2008; Zuzelo, 2007; Pauly, Varcoe, Storch, & Newton, 2009; Varcoe, Pauly, Storch, Newton, and Makaroff, 2012). In addition to futile care, these nurses experience distress related to staffing levels and competence of nurses, physicians, other support staff, and themselves. Rice et al (2008) noted that nurses who cared for oncology and transplant patients reported the highest scores for the intensity of

moral distress in all categories. These same nurses also noted increased frequencies with morally distressing situations associated with physician and nursing practice and futile care. On the other hand, Lazzarin, Biondi, and DiMauro (2012) completed a recent study of nurses working on pediatric oncology units using the Moral Distress Scale – Pediatric Version (MDS-PV). Nurses in this study revealed a low frequency and intensity of moral distress. There were some nurses that revealed they had previously changed positions due to moral distress and these nurses reported higher levels of moral distress than those nurses that did not change positions.

Problems Associated with Moral Distress. Research has also shown that moral distress causes physical, psychological and social issues. Elpern et al (2005) describes the impact of moral distress as: physical, psychological, and behavioral symptoms; effects on personal relationships; job dissatisfaction; burnout; loss of nurses from the workplace; and unwillingness to donate blood or organs. Gutierrez (2005) also identified several themes that participants described as effects of moral distress. The themes included: emotional effects (anger or sadness); physical effects such as pain (headache, neck, muscle, and stomach) and sleep disturbances (dreams, fatigue, and insomnia); social effects (expressing concerns to family and friends); and professional effects (reluctance to return to work; and withdrawal from patients). Ferrell (2006) used a qualitative approach to study moral distress. The most common emotions identified were frustration, distress, anger, and powerlessness. Some of these nurses recalled distressing experiences in detail regardless of how long ago it occurred. Nine (9) of the 108 nurses were considering a career change. The results of this study may be biased since the nurses who responded were attending a course on end of life care. Participants who attend this course may be experiencing difficulty coping with the care provided at the end of life and are seeking ways to improve this care. Schluter et al (2008) conducted a systematic review of the literature on moral

distress and nurse turnover. In addition, Huffman and Rittenmeyer (2012) completed a systematic review of the literature examining the work environment's impact on moral distress. The results of both of these reviews demonstrate that nurses experience physical and psychological effects of moral distress. In addition, the quality of patient care is impacted by nurses withdrawing from patients and families. Moral distress also decreased job satisfaction and is associated with nurses leaving the profession.

Predictors of Moral Distress. Researchers also examined the correlation of several demographic factors and moral distress. For example, the results of a study by Elpern et al (2005) showed that nurses with more experience had a higher rate of moral distress. Rice et al (2008) also used the MDS to study nurses who worked on medical and surgical units. In this study, the researchers also found that nurses who were more than thirty-four (34) years of age; had more than six (6) years of experience; or who had worked more than three (3) years in the same position showed higher MDS scores. Rice et al (2008) suggest that exposure to distressing situations may have a cumulative effect and increase the likelihood of nurses developing moral distress. Mobley, Rady, Verheijde, Patel, and Larson (2007) completed a prospective study in one critical care unit using the Moral Distress Scale (MDS) developed by Corley et al (2001). Although the intensity of moral distress did not correlate with any demographic variable, the frequency of the perception of futile care increased with age, the number of years as a nurse, and the number of years in a critical care setting. In an abstract, Dunwoody (2011) described a non-experimental, descriptive study completed in a single critical care unit. In this study, moral distress was again associated with the number of years as a nurse. Hamric (2012) proposes the "Crescendo Effect" model where moral distress has a cumulative effect that builds up over time.

Summary. Most of the studies on moral distress have been completed with nurses who work in critical care units. On the other hand, it has also been studied previously in a variety of settings including medical surgical units, oncology, and pediatric settings. Research has shown that moral distress may cause physical, psychological, or social issues. There are inconsistent results to demonstrate a correlation between moral distress and demographic characteristics. The current project will examine moral distress in inpatient oncology nurses and determine if there is a correlation between age, education, experience, and type of unit and moral distress scores.

Chapter 3: Methods

Research Design

This project used a cross sectional survey design to explore relationships among nurse characteristics and moral distress.

Sample

Most previous studies have focused on nurses who work in critical care units. Rice et al (2008) describes moral distress scores for nurses who worked in a variety of medical surgical units including oncology. Only one oncology unit was included in Rice's study. The investigators for the current project included nurses from a variety of oncology units. The investigators offered the opportunity to participate in this project to all nurses who work on inpatient units at the Ohio State University (OSU) Arthur G. James Cancer Hospital & Richard J. Solove Research Institute (The James). The James is a National Institute of Health Comprehensive Cancer Center (NCI-CCC) free standing cancer hospital located in Midwestern United States.

The inclusion criteria was employment on an inpatient unit at The James as a direct patient care Registered Nurse who is employed at a 0.5 FTE (fulltime equivalent) or more. The project excluded Advanced Practice Nurses and anyone in a management role.

There are approximately 363 nurses who provide direct patient care on the eight inpatient units at The James. The size of the staff on each unit ranges from 29 – 54 nurses. In previous studies using Corley's (2001) MDS, the response rate was 22% in the study of medical surgical nurses by Pauly, Varcoe, Storch, and Newton (2009) while the response rates ranged from 61 – 90% in studies with critical care nurses (Corley, Elswick, Gorman, and Clor, 2001; Elpern, Covert, & Kleinpell, 2005; Rice, Rady, Hamrick, Verhejde, & Pendergast, 2008). For the

shortened revised questionnaire developed by Hamric, Borchers, and Epstein (2012), the response rate was 44 %. The shortened revised MDS (MDS-R) was used for this scholarly project. Based on these statistics, the expected response rate for this project was conservatively estimated at 35%. A sample size of 130 subjects would achieve 84% probability of detecting a medium size effect ($|\rho| = .25$) at alpha = .05 using a correlation; a 91% probability of detecting a medium-large size effect (f = .35) at alpha = .05 using a one-way ANOVA with 5 groups (types of units); and an 80% probability of detecting a medium size effect ($f^2 = .11$) at alpha = .05 in a linear regression model with 6 predictors (Cohen, J., 1992).

Methods

Permission to conduct the survey was sought from the Ohio State University Nurses Organization (OSUNO), the Chief Nursing Officer of The James, each unit Nurse Manager, and The James Nursing Research Council. The developer of the Moral Distress Scale-Revised (MDS-R) granted permission to the investigators to use the instrument. The project was approved by the Cancer Scientific Review Committee (CSRC) and the Cancer Institutional Review Board (IRB). The cover letter that accompanied the survey briefly described the purpose of the survey; the risks, benefits, and alternatives; the process to ensure confidentiality; and who to contact for questions or assistance. It also included the following consent statement "You indicate your voluntary agreement to participate by completing and returning this questionnaire". Following IRB approval, the investigator attended unit staff meetings to explain the purpose of the project and to answer questions. The MDS-R (Appendix B) and a demographic form (Appendix C) were distributed using the OSU Center for Clinical and Translational Research (CCTS)-sponsored Research Electronic Data Capture (REDCap) Survey software. The survey was kept open for two weeks. The researcher e-mailed the recruitment letter and the link to the

survey using OSUMC Outlook group for the inpatient Registered Nurses [nsg-CHRI-Inpatient RNs]. To maintain privacy, the participants had the option to use their personal computer from home. In addition, the investigators provided a sign to post on a workplace computer that indicated that the survey was in progress and asked staff to respect the participant's privacy. Participants were also encouraged to position the computer so that the screen was not viewed by others.

The OSU CCTS Research Informatics Service Core was used as a central location for data processing and management. Data was collected through REDCap (Research Electronic Data Capture). Vanderbilt University, with collaboration from a consortium of institutional partners (including OSU) and the NIH National Center for Research Resources, developed software and workflow for electronic collection and management of research and clinical trial data (Harris, Taylor, Thielke, Payne, Gonzalez, & Conde, 2009). REDCap data collection allows investigators to collect data electronically using a project-specific data dictionary developed with assistance from the CCTS Research Informatics Services Core. REDCap provides a secure, web-based application that is flexible enough to be used for a variety of research. The system provides an intuitive interface for users to enter data with real time validation rules. The program also allows for easy data manipulation with audit trails and an automated export procedure for data downloads to Excel and common statistical packages (e.g., SPSS, SAS, STATA). As part of the data dictionary development process, individual fields can be denoted as "identifiers". When exporting a de-identified dataset, these variables are omitted. Data was provided to the investigators with respondents identified as random alpha numeric codes. CCTS Research Informatics Services Core provided a user account and data access permission. In addition, the CCTS Regulatory Core reviewed the database prior to its use for active data collection to ensure

that it met the criteria detailed in the approved IRB protocol. Data collected with REDCap Survey are maintained on the secure CCTS-supported REDCap platform behind the OSUMC firewall. The data is only available to the Principle Investigators and will be saved five (5) years per OSU and the College of Nursing policy. Data was downloaded into SPSS software for analysis.

Instruments

The Moral Distress Scale (MDS) developed by Corley, Elswick, Gorman, and Clor (2001) to measure moral distress is used frequently in studies (Elpern, Covert, & Kleinpell, 2005; Mobley, Rady, Verheijde, Patel, & Larson, 2007; Pauly, Varcoe, Storch, & Newton, 2009; Rice, Rady, Hamrick, Verhejde, & Pendergast, 2008; Zuzelo, 2007). This tool includes 38 items that measure moral distress and the frequency it is encountered. The tool uses a seven point Likert-type scale with zero (0) indicating no moral distress and six (6) indicating the most moral distress.

The tool was developed initially by reviewing the literature (Jameton, 1984; Wilkinson, 1988) and isolating concepts to measure moral distress. In addition to evaluating the literature, the investigators conducted interviews with nurses about issues that are specific to moral problems and may be experienced in clinical situations. Consistent with qualitative methods, the interviews were concluded when the researchers noted repetition in the interviews (Miller, 1991). The result of the interviews and literature review led to the creation of a 38-item Moral Distress Scale (MDS) (Corley et al, 2001).

Recently, Hamric, Borchers, and Epstein (2012) revised the MDS scale to create the MDS-R. The scale was abbreviated from the original 38-items to 21-items and the responses were modified from the original 0-6 scale to a 0-4 Likert scale. A composite score of the

frequency and the level of disturbance was also added. This score was calculated by multiplying the two scores for each item, and then summing across the items. Each item has a range of 0-16 and the total score has a range of 0-336. Cronbach's alpha coefficient for the 21 item tool was .89.

There are six versions of the scale for use with adult and pediatric populations and nurse, physician, and other providers. The investigators for this project used the version for nurses who work with adult patients.

Content Validity: Corley et al (2001) evaluated content validity for the original Moral Distress Scale (MDS). Expert opinion was used to determine content validity for the MDS by inviting Drs. Wilkinson (1988) and Jameton (1984), who first identified moral distress, to review the 38-item instrument. They also asked several nurses with PhDs who were considered experts in the field of ethics to assess content validity.

For the MDS-R, Hamric, Borchers, and Epstein (2012) also used expert opinion to determine validity. Each of the four experts independently reviewed the 21-item survey. The interrater agreement among the experts was 88%. They also evaluated the clarity of each item. Full agreement was achieved on 19 of the 21 items on the instrument. As a result, one item was eliminated and one was reworded. The metric for expert opinion of the MDS-R was not illustrated in the publication.

Construct Validity: Construct validity for the MDS-R was evaluated through hypothesis testing (Hamric, Borchers and Epstein, 2012). The hypotheses tested included: 1. Moral distress is correlated with more years of experience ($r = 0.22$; $p = .005$); 2. Nurses have higher levels of moral distress than physicians (mean score for nurses = 91.53 SD = 44.25, mean score for physicians = 62.58, SD = 21.91, $p = <.001$); 3. The unit's ethical climate negatively correlates

with the moral distress scores (r = -.402; p = <.001); 4. High levels of moral distress correlates with healthcare personnel considering leaving their profession (ANOVA F(1,197) = 48.392; p = <.001). The four hypotheses were supported (Hamric, Borchers, & Epstein, 2012). For this project, the investigator operationalized moral distress as a total score and divided the total score range into three parts (as defined by Hamric) to represent low (0-111), moderate (112-223), and high (224-336) levels of moral distress.

Data Analysis

Descriptive statistics were used to summarize the distribution demographics in the sample (age, education, nursing unit, experience as a nurse, in oncology, and at The James). To address the first aim, *to examine the level of moral distress in nurses who work on inpatient oncology units at The James Cancer Hospital as measured by the Moral Distress Scale-Revised (MDS-R)*, the mean, median, and standard deviation of the MDS-R scores were calculated for the total group and by demographic group.

For the second aim, *to compare moral distress by the demographic characteristics of nurses (age and level of education) and work experience variables (years of experience as a nurse, years of oncology experience, years of experience at The James, and the type of unit where they currently work)*, the first analysis used was one-way ANOVA models to assess the statistical significance of relationships between demographic characteristics and moral distress. ANOVA detects differences in mean with no consideration of the underlying order of the independent variable. Linear regression improves the chance of detecting a relationship between the independent and dependent variable if there is a linear relationship between the variables. To take advantage of the potential increase in power afforded by linear regression, linear regression models of MDS-R were fit using each ordinal variable (age, education, and the experience

variables). Two hypotheses for the second aim were developed and evaluated. Hypothesis 1: *Age and years of experience in oncology nursing will correlate positively with moral distress*. Pearson's correlations among age, years of experience in oncology nursing, and the continuous measure of moral distress were estimated to address the first hypothesis. Pearson's correlation is used when the variables have an interval scale that provides both the rank and meaningful differences between values. On the other hand, Spearman's correlations are used with variables that provide only rank. Since the variables for age and experience have both interval and ordinal characteristics, both tests were used. Hypothesis 2: *Nurses who work on units where patients typically have a long length of stay (namely the Blood & Marrow Transplant Unit), will show higher levels of moral distress as compared to nurses who are employed on units where the lengths of stay are shorter*. To address the second hypothesis, first the investigators examined the differences between the mean scores of BMTU and the mean scores of the other units. Then the investigators used analysis of variance (ANOVA).

Finally, to address the third specific aim, *to identify demographic characteristics and type of clinical setting that may predict which nurses are at high risk for moral distress*, a multiple regression model was fit. Those characteristics found to have a statistically significant relationship with moral distress in bivariate analyses were included in the model. The regression coefficients were used to estimate the level of moral distress on each unit for the varying levels of education.

Chapter 4: Findings

Results

Sample Description: The survey was sent to 363 staff nurses working at least 50% at The James. One hundred nurses completed the survey for an initial response rate of 27.5%. After excluding surveys with missing responses, the actual response rate was 20%. This is less than the 36% needed to predict a medium size effect. Fourteen (14) of the respondents failed to answer 1-2 questions within the MDS-R and thirteen (13) failed to answer more than two questions. These thirteen (13) failed to answer most of the disturbance questions. Since the frequency questions and the disturbance questions are phrased exactly the same, the respondents may have thought that they answered the question previously. This is a potential deficiency in using an electronic system that does not allow the questions to be visualized side by side as in the paper version. The distribution of age, education, type of unit, and experience as a nurse, in oncology, and at The James are provided in Tables 1 and 2. The tables show the characteristics for those 73 respondents that completed all MDS-R questions (Table 1) and for those participants who had missing data (Table 2). The characteristics for both groups are similar.

After finding statistical significance for the effect of education and the type of unit on the MDS-R scores, data were imputed for the 27 subjects with missing responses to test if there would be added value with these scores. The investigators used multiple imputation, a technique described by Rubin (1987). Multiple imputation begins by replacing a subject's missing data with plausible values. The range in choices reflects the uncertainty in the missing value based on the subject's responses to the other variables in the dataset. Ten (10) MDS-R scores were generated for each missing score, resulting in ten (10) datasets. Each dataset was then evaluated using the same analyses that were performed on the data of the 73 MDS-R scores of the

participants with no missing data. For example, a correlation between MDS-R and years of experience was computed ten (10) times. The statistics from the multiple analyses were then averaged to give a single estimate. The generation of the ten (10) datasets was done using SAS's MI procedure and the generation of the average statistics was done using SAS's MIANALYZE procedure that provides the statistical significance of the averaged results. The statistically significant results from the imputed data were consistent with those obtained using only the data from respondents with MDS-R scores. Imputed data may improve the power but in this case it did not. Therefore, the results reported here will be only those obtained from respondents (n=73) who completed all MDS-R questions.

Aim One: To examine the level of moral distress in nurses who work on inpatient oncology units at The James Cancer Hospital as measured by the Moral Distress Scale – Revised (MDS-R). For the MDS-R scores for the entire sample, the mean was 81.36, the median was 77.0, and the standard deviation was 50.8. The scores ranged from 4.0 to 266. The majority of the nurses reported low MDS-R scores but sixteen (16) had moderate scores (112-223) and two (2) had high scores (224-336). There were several nurses that had scores on the upper level of the low scores (more than 100) and if the moderate level is changed to 100 – 200, 21 nurses fall in this category. The description of MDS-R scores as a function of the subject characteristics are displayed in Table 3.

Aim Two: To compare moral distress by the demographic characteristics of nurses (age and level of education) and work experience variables (years of experience as a nurse, years of oncology experience, years of experience at The James, and the type of unit where they currently work). The analysis of variance (ANOVA) tests the significance of the differences between the mean for each group. It also infers whether the difference is related to

chance or if it may be related to the independent variable. Table 4 displays the ANOVA results for the MDS-R scores for each of the demographic characteristics. The age, education, and years of experience at The James variables had levels that included less than 5 subjects. To perform ANOVA with these variables, the levels were compressed. For the age category, only two (2) respondents responded that they were between 60-70 years of age so this group was combined with the 50-59 years of age group to form ">50 years" of age group. Similarly, two (2) respondents indicated that their highest level of education was a diploma so this was combined with the Associate Degree group ("Diploma/AD") and only two (2) respondents indicated that they had a graduate degree in another field so this group was also combined ("graduate degree"). Finally, there were six (6) respondents that indicated that they had more than 20 years of experience at The James. This experience group was combined with the 10-20 years to form a more than 10 years of experience group. Only the "Unit" variable showed a statistically significant difference ($p=.029$).

Table 5 displays the linear regression results. There was a statistically significant inverse relationship between education and MDS-R ($p=0.02$). There is no difference between age or experience and MDS-R. The coefficient of determination (R^2) provides the proportion of the variance in the dependent variable accounted for by the independent variable. The R Square for education, 0.07 indicates that 7% of the variance in the MDS-R scores is explained by the level of education.

Hypothesis 1: Age and years of experience in oncology nursing will correlate positively with moral distress. To test for correlation between variables, Pearson's r and Spearman's rho were used. The results are displayed in Table 6. The variant forms of correlation

have consistent results of no statistically significant correlations. The hypothesis that age and years of experience will correlate with moral distress was not supported by the data analysis.

Hypothesis 2: Nurses who work on units where patients typically have a long length of stay (namely the Blood & Marrow Transplant Unit), will show higher levels of moral distress as compared to nurses who are employed on units where the lengths of stay are shorter. Table 7 shows the estimated differences between the mean scores of the BMTU and each other unit type. There was only a statistically significant difference between the mean scores of the BMTU and the Medical/Surgical units (*p=0.01*), a partial support for the second hypothesis. The ANOVA was statistically significant (*p=0.03*), indicating at least one pair-wise difference is statistically significant.

Aim 3: To identify demographic characteristics and type of clinical setting that may predict which nurses are at high risk for moral distress. To develop a model to predict which nurses may be at risk for moral distress, a multiple regression of MDS-R was fit using as predictors the two characteristics that showed some correlation with the MDS-R scores: education and the unit. Table 8 shows a summary of the regression model. The unit effect using this model was *p=0.036* and the education effect was *p=0.039*. Both coefficients were statistically significant. The resulting model was used to predict the level of moral distress on each unit for the varying levels of education. The model predictions for each unit are provided in Table 9 and plotted in Figure 1.1. For example, for the BMTU, the model predicts that the nurses with a diploma in nursing will have a MDS-R score of 133.51. For each higher level of education, the MDS-R will decrease by 13.78.

Discussion

Most of the previous research on moral distress used Corley's (2001) original tool. This measures nurse's perception of the intensity and the frequency of moral distress separately. In Hamric's revised tool, the intensity score is multiplied by the frequency score for each question and the sum of all scores produce the MDS-R score (Hamric, A. B., Borchers, C. T., & Epstein, E. G., 2012). Corley's tool also uses a seven (7) point Likert scale versus the five (5) point Likert scale for the MDS-R survey used in this project (Hamric, A. B., Borchers, C. T., & Epstein, E. G., 2012). The one study that used Corley's tool that included oncology nurses found that these nurses had higher scores than the nurses who worked on medical-surgical units. They identified futile care and poor symptom management as issues that were most distressing (Rice et al, 2008). In the study by Hamric, A. B., Borchers, C. T., and Epstein, E. G. (2012), the mean score for the nurses who worked on critical care units was 91.53 with a range of 3-256. In the current project, the mean score for the MDS-R was 81.36 and the range was 4.0 - 266. These are slightly lower than the scores found for critical care nurses. One possibility for this difference may be that nurses who work in oncology self-select to work with patients who may be at the end of life. Therefore, issues with end of life may be expected. In addition, the culture or the environment of The James may also affect the results. The nurses at The James identified issues related to false hope (2.84); prolonging death (2.82); following family's wishes to continue treatment (2.62) or not discuss death with the patient (2.82); inadequate pain management (3.03); competency (2.85); and communication (2.9) that caused the highest level of disturbance (scores on a 0-4 scale). On the other hand, they reported low frequency with only a few categories with scores more than two (2). Those categories with the highest reported frequency were false hope (2.24); following the family's wishes to continue treatment (2.15); prolonging death (2.27); and

communication (2.04). This response is similar to that found in the other study of oncology nurses (Rice et al, 2008).

Several authors report a correlation between moral distress and years of experience (Elpern et al, 2005; Rice et al, 2008) and age (Rice et al, 2008).This was not supported in the current project. Although several authors reported the education level of the participants, they did not report correlations with education and level of moral distress (Elpern et al, 2005; Hamric & Blackwell, 2007; Hamric, Borchers, & Epstein, 2012). A unique finding in the current project showed a correlation between education and the MDS-R scores ($p=0.02$). Education was negatively correlated with the MDS-R score with the MDS-R decreasing as the level of education increased. This may be a result of the inclusion of ethics courses in the bachelor's and graduate levels. Another possibility is that higher education may prepare nurses to use critical thinking skills and these nurses may have more confidence in their decisions. There was also a correlation between unit and the MDS-R scores ($p=0.03$). Although it was anticipated that the nurses on the BMTU would have the highest scores, this was not supported in the data. Unexpectedly, the nurses who work on surgical units had the highest mean scores (124.2) with the nurses on the BMTU having the next highest (108.3). The high scores for nurses working on surgical units may be due to the invasive and sometimes disfiguring types of surgery done at The James. It would be interesting to repeat this survey with surgical nurses who work in other NIH-CCC cancer hospitals where similar surgeries may be performed.

Although not addressed in the aims of the project, it is interesting to note that of the 73 participants, 22 (30.1%) considered leaving a previous position related to moral distress and 5 (6.8%) actually left a previous position. 20 (27.4%) of the total participants and 10/21 (47.6%) of

the nurses who reported moral distress scores >100 (N=21) are considering leaving their current position.

Conclusion

Nurses who work on inpatient oncology units at this institution report low to moderate moral distress. The level of education and the type of unit where the nurse works may be useful predictors of the level of moral distress. A model was developed that predicts the level of moral distress based on the nurse's education level and the type of unit where she works.

Chapter Five

Project Summary

Moral distress was described by Jameton, as "when one knows the right thing to do, but institutional constraints make it nearly impossible to pursue the right course of action" (1984, p.6). There have been many previous studies of moral distress in nurses who work in critical care units and a few studies of nurses outside the critical care arena. Most of these studies have used the MDS tool developed by Corley (2001). Recently, Hamric and her colleagues revised the tool to form the MDS-R tool (Hamric, A. B., Borchers, C. T., & Epstein, E. G., 2012) that is a shortened version with 21 items. It also allows for a composite score of the frequency and level of disturbance that health care providers perceive. There are six versions of the tool for use with different patient populations (adult and pediatric) and type of health care provider (nurse, physician, and other providers). The investigators for this project used the version for nurses who work with adult patients.

The project had three aims: 1. to examine the level of moral distress in nurses who work on inpatient oncology units; 2. to compare moral distress by the demographic characteristics of nurses and work experience variables; and 3. to identify demographic characteristics and type of clinical setting that may predict which nurses are at risk for moral distress.

After approval by the Cancer Scientific Review Committee (CSRC) and the Institutional Review Board (IRB), the investigators distributed the MDS-R and a demographic tool to all inpatient staff nurses who work at The James using the OSU Center for Clinical and Translational Research (CCTS)-sponsored Research Electronic Data Capture (REDCap) Survey software. The survey remained open for two weeks. The response rate was 20% (73/363).

Prior to conducting the project, the investigators had two hypotheses. The hypothesis that age and years of experience in oncology nursing will correlate positively with moral distress was not supported in the data. On the other hand, a surprising finding was a negative correlation between the level of education and MDS-R scores. The second hypothesis that the nurses who work on units where patients typically have a long length of stay will show higher levels of moral distress than those nurses who work on other units was only partially supported. There was a statistically significant difference (*p=0.014*) between the scores of the nurses who work on the BMTU and nurses who work on medical/surgical units. Another unexpected finding was the high MDS-R scores for the nurses who work on surgical units. The data showed a statistically significant difference between the mean scores of the surgical unit and the medical units (*p=0.037*) and the surgical units and the medical/surgical units (*p=0.009*).

Based on these results, a model was developed to predict nurses who may be at risk for moral distress using two characteristics, the level of education and the type of unit where the nurse works. For each unit, the model predicts that the level of moral distress will decrease by 13.78 (MDS-R points) for each higher level of education.

Limitations

The major project limitation is that the project only included oncology nurses from one institution. The institution is a NCI-CCC designated free standing cancer hospital. Therefore, the results may not apply to oncology nurses in general hospitals. Another limitation is the response rate. The response rate was only 20%. Repeating this project with the same population as well as oncology nurses in other institutions may strengthen the findings.

Implications for Nursing Practice and to the DNP Essentials

This project supports previous evidence that nurses who work in oncology settings have lower moral distress than nurses who work in critical care settings. Moral distress may lead to physical, psychological, social, and professional problems. This may result in nurses leaving their position or even the profession of nursing (Davis, Schrader, and Belcheir, 2012; Elpern, Covert, and Kleinpell, 2005; Ferrell, 2006; Huffman and Rittenmeyer, 2012; Schluter, Winch, Holzhauser, and Henderson, 2008; Varcoe, Pauly, Webster, and Storch, 2012; Weingand and Funk, 2012). In the current project, 20 (27.4%) of the total participants and 10/21 (47.6%) of the nurses who reported moral distress scores >100 report that they are considering leaving their current position.

In addition, moral distress also affects the nurse's relationships with patients and families. Nurses may withdraw from patients which may lead to lower quality care and decreased patient satisfaction (DeVillers and Devon, 2012; Gutierrez, 2005; Huffman and Rittenmeyer, 2012; Schluter et al, 2008; Varcoe, Pauly, Storch, Newton, and Makaroff, 2012). Primary nursing is a key component of The James nursing Professional Practice Model based on Relationship-Based Care. The relationship with the patient and their family forms the basis for primary nursing. Therefore, steps must be taken to avoid nurses withdrawing from patients due to moral distress.

The American Association of Critical Care Nurses (AACN, 2008) developed a position statement on moral distress. This position statement makes recommendations for the individual nurse and for the organization. Some of the recommendations for the organization include processes to identify moral distress and potential causes for distress; offering staff support through individual and group counseling and debriefing; and staff and physician education on the use of ethics committees and how to manage moral distress. In addition, the AACN offers a

facilitator's toolkit to use as a guide for an intervention for moral distress. The toolkit provides a framework for ethics rounds and offers case studies that may be used during these sessions. Ethics rounds are informal meetings that include interested members of the interdisciplinary team. During the meeting, ethical issues are discussed using a case study approach. Although real life cases may be used, groups may find it more comfortable to begin with cases from the toolkit.

A strategy to diminish moral distress involves a comprehensive plan. Several authors (Ferrell, 2006; Gutierrez, 2005; Mobley, 2007; Rice, 2007; Shepard, 2010; Zuzelo, 2007) recommend education on ethics, moral distress, coping strategies, and available resources. Pendry (2007) suggests that education on moral distress should be added to orientation programs. One strategy for education offered by several authors (Cohen & Erickson, 2006; Gutierrez, 2005; Zuzelo, 2007) is ethics rounds where case studies are discussed that present ethical dilemmas. The AACN position statement (2008) agrees that education should be provided on how to handle moral distress. In addition, this position statement also recommends "critical stress debriefings". Pendry (2007) found that nurses who were able to share their feelings were relieved that they were not the only one experiencing these feelings. Mobley (2007) recommends regularly scheduled interdisciplinary meetings to discuss and resolve ethical issues and concerns through actual case conferences and case scenarios. Some authors (Mobley, 2007; Pendry, 2007; Shepard, 2010) recommend that organizations offer individual or group counseling. Finally, a few authors (Cohen & Erickson, 2006; Shepard, 2010; Zuzelo, 2007) suggested that nurses have a seat on the ethics committee so that they can participate in policy development and decision-making about ethical situations.

There has been limited research on the effects of these interventions for moral distress. Future research studying interventions to prevent moral distress may benefit the nursing community.

This project applies to Essential III of Doctoral Education for Advanced Nursing Practice that outlines how Doctor of Nursing Practice (DNP) graduates are responsible to translate research into practice. This project expanded on previous research on moral distress to apply it to a different population of oncology nurses in an inpatient setting. This project found that oncology nurses in one institution reported low to moderate levels of moral distress. The level of education of the nurse and the type of unit where the nurse works may serve as predictors for the level of moral distress.

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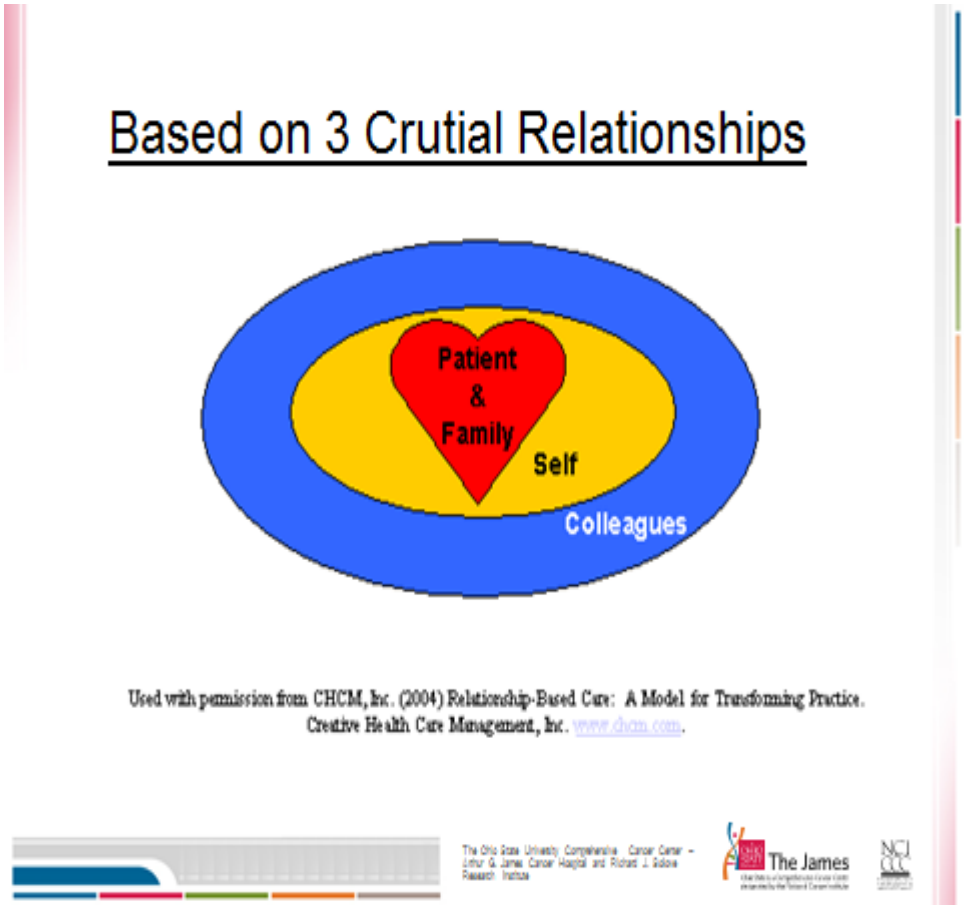
Appendix A


Based on 3 Crutial Relationships
Patient
&
Family
Self
Colleagues
Used with permission from CHCM, Inc. (2004) Relationship-Based Care: A Model for Transforming Practice.
Creative Health Care Management, Inc. www.chcm.com.
The Ohio State University Comprehensive Cancer Center – James Cancer Hospital and Richard J. Solove Research Institute
The James
NCI

Appendix B

MDS-R
Nurse Questionnaire (ADULT)

Moral distress occurs when professionals cannot carry out what they believe to be ethically appropriate actions because of internal or external constraints. The following situations occur in clinical practice. If you have experienced these situations they may or may not have been morally distressing to you. Please indicate how frequently you experience each item described and how disturbing the experience is for you. If you have never experienced a particular situation, select "0" (never) for frequency. Even if you have not experienced a situation, please indicate how disturbed you would be if it occurred in your practice. Note that you will respond to each item by checking the appropriate column for two dimensions: *Frequency* and *Level of Disturbance*.

	Frequency					Level of Disturbance				
	Never				Very frequently	None				Great extent
	0	1	2	3	4	0	1	2	3	4
1. Provide less than optimal care due to pressures from administrators or insurers to reduce costs.										
2. Witness healthcare providers giving "false hope" to a patient or family.										
3. Follow the family's wishes to continue life support even though I believe it is not in the best interest of the patient.										
4. Initiate extensive life-saving actions when I think they only prolong death.										
5. Follow the family's request not to discuss death with a dying patient who asks about dying.										
6. Carry out the physician's orders for what I consider to be unnecessary tests and treatments.										
7. Continue to participate in care for a hopelessly ill person who is being sustained on a ventilator, when no one will make a decision to withdraw support.										
8. Avoid taking action when I learn that a physician or nurse colleague has made a medical error and does not report it.										
9. Assist a physician who, in my opinion, is providing incompetent care.										
10. Be required to care for patients I don't feel qualified to care for.										
11. Witness medical students perform painful procedures on patients solely to increase their skill.										

	Frequency					Level of Disturbance				
	Never				Very frequently	None				Great extent
	0	1	2	3	4	0	1	2	3	4
12. Provide care that does not relieve the patient's suffering because the physician fears that increasing the dose of pain medication will cause death.										
13. Follow the physician's request not to discuss the patient's prognosis with the patient or family.										
14. Increase the dose of sedatives/opiates for an unconscious patient that I believe could hasten the patient's death.										
15. Take no action about an observed ethical issue because the involved staff member or someone in a position of authority requested that I do nothing.										
16. Follow the family's wishes for the patient's care when I do not agree with them, but do so because of fears of a lawsuit.										
17. Work with nurses or other healthcare providers who are not as competent as the patient care requires.										
18. Witness diminished patient care quality due to poor team communication.										
19. Ignore situations in which patients have not been given adequate information to insure informed consent.										
20. Watch patient care suffer because of a lack of provider continuity.										
21. Work with levels of nurse or other care provider staffing that I consider unsafe.										
If there are other situations in which you have felt moral distress, please write them and score them here:										

Have you ever left or considered quitting a clinical position because of your moral distress with the way patient care was handled at your institution?

No, I've never considered quitting or left a position _____
Yes, I considered quitting but did not leave _____
Yes, I left a position _____

Are you considering leaving your position now? Yes No

Appendix C

Moral Distress Project

Demographic Form

What is your age?

___ 20-29 years of age

___ 30-39 years of age

___ 40-49 years of age

___ 50-59 years of age

___ 60-70 years of age

What best describes the type of Nursing Unit where you work (select all that apply):

___ Medical

___ Surgical

___ Medical/Surgical

___BMTU

___Float Pool

What is your highest level of education:

___ Diploma in nursing

___ AD, nursing

___ BS, nursing

___ BS, other field

___ Graduate degree, nursing

___ Graduate degree, other field

How many years have you worked as a nurse?

___ 0-2 years

___ 3-5 years

___ 5-10 years

___ 10-20 years

___ >20 years

How many years have you worked

In oncology?

___ 0-2 years

___ 3-5 years

___ 5-10 years

___ 10-20 years

___ >20 years

How many years have you worked

@ The James as a nurse?

___ 0-2 years

___ 3-5 years

___ 5-10 years

___ 10-20 years

___ >20 years

Table 1

Demographics – all subjects with MDS-R scores (n=73)

Variable	Category	Number (%)
Age	20-29 years	25 (34.2%)
	30-39 years	24 (32.9%
	40-49 years	12 (16.4%)
	50-59 years	9 (12.3%
	60-70 years	2 (2.7%)
	Missing data	1 (1.4%
Education	Diploma, nursing	2 (2.7%)
	AD, nursing	6 (8.2%)
	BSN	53 (72.6%)
	BS, other field	5 (6.8%)
	MS, nursing	5 (6.8%)
	Graduate degree, other field	2 (2.7%)
Unit	Medical	19 (26%)
	Surgical	6 (8.2%)
	Medical/Surgical	28 (38.4%)
	BMTU	12 (16.4%)
	Float Pool	7 (9.6%)
	Missing data	1 (1.4%)
Experience as a nurse	0-2 years	16 (21.9%)
	3-5 years	15 (20.5%)
	5-10 years	18 (24.7%)
	10-20 years	17 (23.3%)
	>20 years	7 (9.6%)
Experience in oncology	0-2 years	19 (26%)
	3-5 years	15 (20.5%)
	5-10 years	18 (24.7%)
	10-20 years	14 (19.2%)
	>20 years	6 (8.2%)
	Missing data	1 (1.4%)
Experience at The James	0-2 years	25 (34.2%)
	3-5 years	21 (28.8%)
	5-10 years	11 (15.1%)
	10-20 years	11 (15.1%)
	>20 years	4 (5.5%)
	Missing data	1 (1.4%)

Table 2

Demographics – subjects with missing data (n=27)

Variable	Category	Number (%)
Age	20-29 years	6 (22%)
	30-39 years	8 (30%)
	40-49 years	6 (22%)
	50-59 years	4 (15%)
	60-70 years	1 (3%)
	Missing data	2 (7%)
Education	Diploma, nursing	1 (3%)
	AD, nursing	1 (3%)
	BSN	19 (70%)
	BS, other field	1 (3%)
	MS, nursing	1 (3%)
	Graduate degree, other field	2 (7%)
	Missing data	2 (7%)
Unit	Medical	7 (26%)
	Surgical	3 (11%)
	Medical/Surgical	10 (37%)
	BMTU	3 (11%)
	Float Pool	3 (11%)
	Missing data	1 (3%)
Experience as a nurse	0-2 years	4 (15%)
	3-5 years	6 (22%)
	5-10 years	7 (26%)
	10-20 years	5 (19 %)
	>20 years	4 (15%)
	Missing data	1 (3%)
Experience in oncology	0-2 years	9 (33%)
	3-5 years	4 (15%)
	5-10 years	6 (22%)
	10-20 years	4 (15%)
	>20 years	4 (15%)
Experience at The James	0-2 years	10 (37%)
	3-5 years	4 (15%)
	5-10 years	8 (30%)
	10-20 years	3 (11%)
	>20 years	2 (7%)

Table 3

Mean, median, and standard deviation of MDS-R scores by demographic characteristics

Variable	Category	N	Mean (SD)	Median
Unit	Surgical	6	124.17 (65.56)	97.50
	BMTU	12	108.25 (64.85)	93.00
	Float Pool	7	80.00 (46.82)	95.00
	Medical	19	75.79 (33.10)	77.00
	Medical/Surgical	28	65.75 (46.07)	68.50
Age	20-29 years	25	75.56 (40.19)	80.00
	30-39 years	24	81.17 (52.83)	73.50
	40-49 years	12	87.83 (47.70)	75.00
	>50 years	11	90.36 (74.05)	83.00
Education	Diploma/AD, nursing	8	92.88 (50.91)	91.50
	BSN	53	85.91 (50.30)	77.00
	BS, other field	5	63.40 (26.15)	56.00
	Graduate degree	7	46.57 (59.32)	19.00
Years as a nurse	0-2 years	16	70.31 (36.85)	70.00
	3-5 years	15	80.87 (38.89)	80.00
	5-10 years	18	79.33 (60.38)	70.50
	10-20 years	17	81.76 (46.46)	79.00
	>20 years	7	111.86 (80.81)	112.00
Years in oncology	0-2 years	19	82.79 (43.56)	89.00
	3-5 years	15	69.20 (45.98)	69.00
	5-10 years	18	79.56 (54.63)	71.00
	10-20 years	14	84.79 (43.46)	82.50
	>20 years	6	109.17 (88.18)	91.00
Years @ The James	0-2 years	25	79.00 (39.88)	77.00
	3-5 years	21	74.62 (43.07)	77.00
	5-10 years	11	86.00 (65.48)	70.00
	>10years	15	93.13 (67.34)	82.00

Table 4

ANOVA Results between each demographic characteristic and MDS-R

Variable	ANOVA p value
Age	0.84
Education	0.19
Unit	0.03*
Experience as a nurse	0.52
Experience in oncology	0.62
Experience @ The James	0.74

Note. *$p<.05$

Table 5

Linear regression results for MDS-R on ordinal subject characteristics

Predictor	Parameter estimate	95%CI	Effect *p* value	R^2
Age	5.53	[-5.24, 16.30]	0.31	0.015
Education	-15.38	[-28.59, -2.16]	0.02*	0.07
Experience				
Nurse	6.60	[-2.56, 15.76]	0.16	0.028
Oncology	4.37	[-4.97, 13.72]	0.35	0.012
At James	4.72	[-4.97, 14.41]	0.33	0.013

Note. CI = confidence interval. *p <.05

Table 6

Correlations between demographic characteristics (age, education, and experience) and MDS-R

6 A, Pearson Correlations

Variable	Correlation	*p* value
Years as nurse	0.17	0.16
Years in oncology	0.11	0.35
Years at The James	0.12	0.34
Age	0.12	0.31

6 B, Spearman Correlations

Years as nurse	0.12	0.33
Years in oncology	0.04	0.71
Years at The James	0.03	0.78
Age	0.07	0.57

Table 7

Estimated differences between BMTU and other units

Comparison	Estimated differences	95% CI	*p* value
BMTU – Float Pool	28.25	[-17.84, 74.34]	0.23
BMTU – Medical	32.46	[-3.27, 68.19]	0.07
BMTU – Med/Surg	42.50	[9.06, 75.94]	0.01**
BMTU – Surgical	-15.92	[-64.37, 32.54]	0.51

Note. CI = confidence interval. ***p<0.1*

Table 8

Regression model summary with 2 variables (unit and education)

Predictor	parameter estimate	95% CI	*p value*
Intercept	156.32	[107.16, 205.47]	
Unit			0.036*
BMTU	-22.81	[-70.52, 24.91]	
Float Pool	-46.79	[-99.45, 5.86]	
Medical	-52.24	[-96.67, -7.82]	
Med/Surg	-59.07	[-101.61, -16.54]	
Surgical	0.00		
Education	-13.78	[-26.82, -0.73]	0.039*

Note. CI = confidence interval. *p<0.05

Table 9

Estimate of differences of MDS-R scores based on regression by unit and education

Unit	Education	Predicted Average MDS-R
BMTU	Diploma	133.51
	AD	119.73
	BSN	105.95
	BS, other field	92.18
	Graduate degree, nursing	78.40
	Graduate degree, other	64.62
Float Pool	Diploma	109.53
	AD	95.75
	BSN	81.97
	BS, other field	68.19
	Graduate degree, nursing	54.41
	Graduate degree, other	40.63
Medical	Diploma	104.07
	AD	90.29
	BSN	76.51
	BS, other field	62.74
	Graduate degree, nursing	48.96
	Graduate degree, other	35.18
Med/Surg	Diploma	97.24
	AD	83.47
	BSN	69.69
	BS, other field	55.91
	Graduate degree, nursing	42.13
	Graduate degree, other	28.35
Medical	Diploma	156.32
	AD	142.54
	BSN	128.76
	BS, other field	114.98
	Graduate degree, nursing	101.20
	Graduate degree, other	87.42

Figure 1.1. Multivariate Model Projections Graph

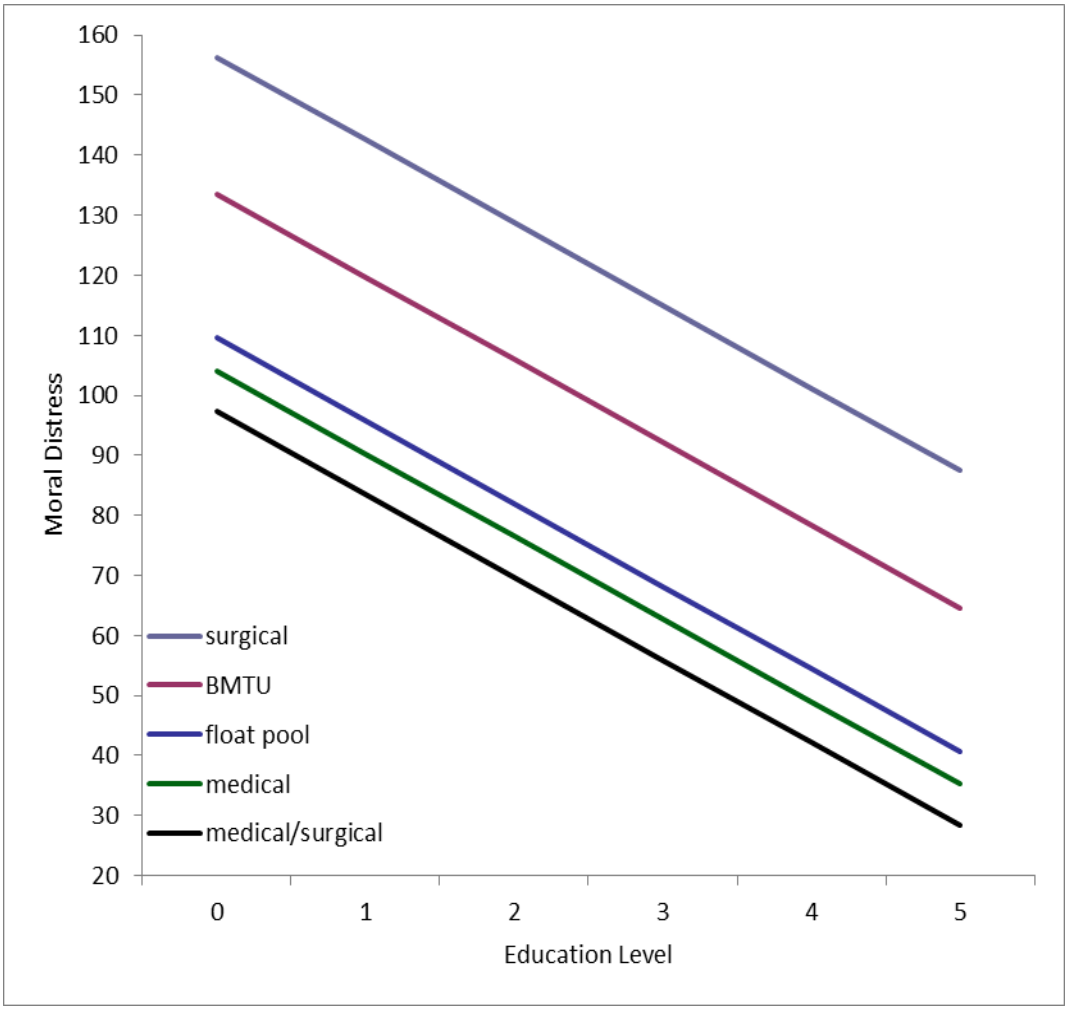


Figure 1.1. Education: 0 = Diploma in nursing; 1 = AD in nursing; 2 = BSN; 3 = BS, other field; 4 = Graduate degree, nursing; 5 = Graduate degree, other field.